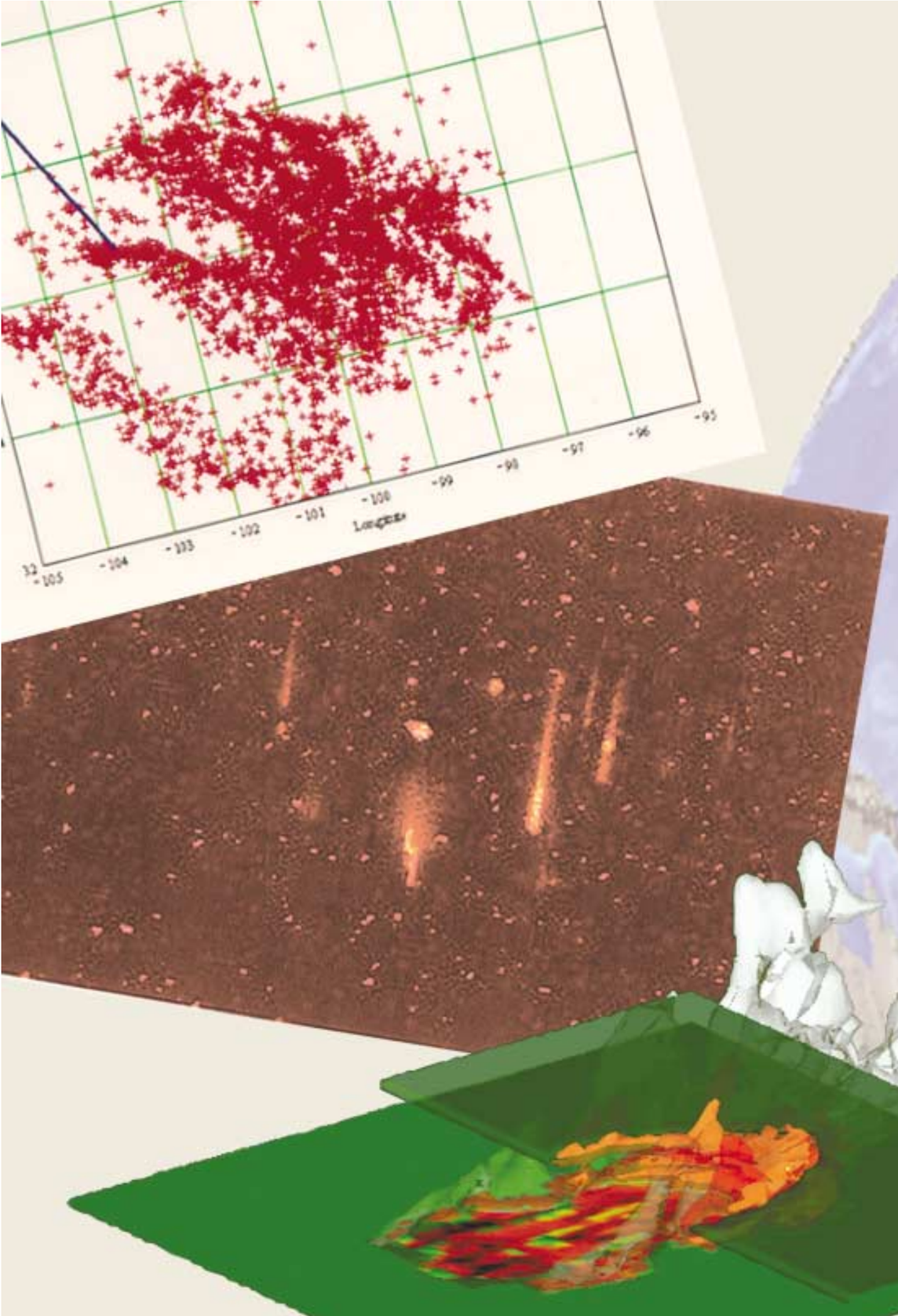

Models and Observations of the Atmosphere and Oceans

Observations and models of the Earth system and its various components are central to EES. Because our sponsors' interests span the entire range of scales, from global to local, in this complex set of phenomena, EES research is concerned with a wide variety of processes in both the oceans and the atmosphere. The EES computer modeling efforts, catalyzed by the computational resources at LANL and motivated by the need to improve understanding of hard-to-observe phenomena, tend to concentrate on very-high-resolution simulations. Our observational studies fall into two broad categories, those that leverage LANL expertise developed in national security programs, and those that integrate a variety of observations into a coherent package.

The projects discussed in this section are arranged in, approximately, order of decreasing scale. The global ocean-modeling studies are part of a program to improve our ability to understand and predict climate change. This theme of understanding and predicting carries through the research on smaller and smaller scales, and, when it becomes possible to make single-point observations that are meaningful, the observational capability becomes integrated with the modeling.

Additional examples of this work are discussed in the Research Highlights section.